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DEPARTMENT OF THE ARMY
UNITED STATES ARMY AVIATION TEST BOARD ✓
Fort Rucker, Alabama 36360

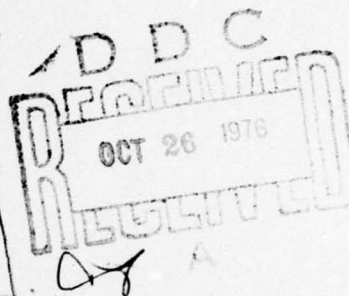
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MAY 25 1967

SUBJECT: Letter Report, Armament Test on AH-1G Helicopter
(HUEYCOBRA), RDT&E Project No. IX41807D174,
USATECOM Project No. 4-6-0500-02 ✓

TO: Commanding General
US Army Test and Evaluation Command
ATTN: AMSTE-BG
Aberdeen Proving Ground, Maryland 21005

16 RDT/E-1-X-41807-D-174
USATECOM-4-6-0500-02



1. References.

- a. Plan of Test, USATECOM Project No. 4-6-0500-02,
"Logistical Evaluation Test of AH-1G Helicopter (Huey Cobra)," US
Army Aviation Test Board, 15 December 1966.
- b. Letter, AMSTE-BG, Headquarters, US Army Test and
Evaluation Command, 11 January 1967, subject: "Test Outline for
Armament Tests on AH-1G (Huey Cobra)."
- c. Letter, STEAP-DS-TI, Aberdeen Proving Ground, 25
January 1967, subject: "Test Outline for Armament Tests on AH-1G
Helicopter (Huey Cobra), USATECOM Project No. 4-6-0500-01."
- d. Letter, AMSTE-BG, Headquarters, US Army Test and
Evaluation Command, 8 February 1967, subject: "Test Outline for
Armament Tests on AH-1G Helicopter (Huey Cobra), USATECOM
Project No. 4-6-0500-01."

2. Background.

- a. The Army has an immediate need for an interim armed
helicopter capable of delivering weapons fire in low altitude, high

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speed flight; deliverable within normal UH-1B Helicopter reorder time; and capable of entering service directly from production. The AH-1G was developed specifically to meet this urgent operational requirement by providing an interim weapons helicopter of improved capabilities to assume those missions presently assigned to the armed UH-1B and UH-1C Helicopters.

b. The contractor conducted armament qualification tests of the weapons systems utilized on the AH-1G. USATECOM directed the US Army Aviation Test Board (USAAVNTBD) and Aberdeen Proving Ground (APG) to conduct additional armament testing of the TAT-102 and other armament subsystems in the areas where the contractor armament testing was considered insufficient (reference 1b).

3. Purpose. To evaluate the armament subsystems on the AH-1G Helicopter.

4. Description of Materiel.

a. TAT-102 Chin Turret. The Tactical Aircraft Turret 102 (TAT-102) is a chin-mounted turret containing a high rate, XM-134, six-barrel, 7.62mm machinegun. The turret and machinegun are hydraulically powered. The turret is controlled in the flex mode from the copilot/gunner's sight and is capable of traversing 100 degrees left and 100 degrees right of center, elevating 25 degrees, and depressing 50 degrees. In the stowed position, the TAT-102 can be fired from both the pilot's and copilot/gunner's cyclic-pitch control grips. The TAT-102 has an ammunition capacity of 8,000 linked rounds.

b. XM-18 Gun Pod. The XM-18 consists of an XM-134 high rate, six-barrel, 7.62mm electrically driven machinegun, a linkless feed system, and a 24-volt direct current nickel-cadmium battery mounted in an external stores pod. A drum assembly contained in the pod stores 1,500 rounds of linkless ammunition. One XM-18 gun pod is mounted on each of the two inboard pylons of the AH-1G Helicopter.

c. XM-157 Rocket Launcher Pod. The XM-157 is a seven-tube, reusable, external stores pod designed to fire the 2.75-inch

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Limited Spin Folding Fin Aerial Rocket (LSFFAR). During the test, an XM-157 was mounted on each outboard pylon of the AH-1G.

d. XM-159 Rocket Launcher Pod. The XM-159 is a nineteen-tube, reusable, external stores pod designed to fire the 2.75-inch LSFFAR. During the test, an XM-159 was mounted on each of the four external pylons of the AH-1G.

5. Summary of Results.

a. TAT-102. During this test, 69,800 rounds of ammunition were fired. Nineteen chargeable malfunctions and two non-chargeable malfunctions were recorded. The two non-chargeable malfunctions were caused by personnel errors. A breakdown of the 19 chargeable malfunctions follows:

<u>No. of Malfunctions</u>	<u>Probable Cause</u>
7	Undetermined
1	Gun drive adapter loosened
5	Expend brass lodged in weapon
4	Expend links lodged in feeder delinker
1	Ammunition jammed in ammo can
1	Ammunition jammed in chuting

The Mean Rounds to Stoppage was 3,674.

b. XM-18. During this test, 17,000 rounds of ammunition were fired. One chargeable malfunction was recorded. This malfunction was caused by a ruptured cartridge in the gun barrel.

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c. XM-157. During this test, 98 LSFFAR's (2.75-inch) were fired.

(1) Maximum effective range of the rockets was approximately 1,300 meters. There was no adjustment between the wing station and rocket pod to elevate the pod to increase the range.

(2) The intervalometer which controlled the rocket selection was considered unacceptable (see paragraph f(1)).

d. XM-159. During this test, 150 LSFFAR's (2.75-inch) were fired. The range and intervalometer problems mentioned in paragraph c also existed during this test.

e. Sight.

(1) Mil settings on the pilot's sight were not accurate. Throughout the mil setting range, the average impact area was between 500 and 1,000 meters short of target. The settings appeared to have been taken from information on the UH-1() sight settings.

(2) Four reticle bulbs for the pilot's sight were replaced during the test.

f. Fire Controls.

(1) The rocket pod intervalometer had no memory circuit. If the pilot selected one pair of rockets and fired, then moved the master armament switch to safe or selected another wing station, the stepping switch, which is within the aircraft structure and inaccessible, returned to zero automatically. Thus, when the pilot returned to fire another pair of rockets he had to pull the trigger twice, one for the pair that had already been fired and again for the pair he intended to fire.

(2) The override switch on the copilot/gunner's fire control panel could inadvertently be placed in the ON position, thus causing the pilot to have no control of firing from the turret. The switch should

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be covered with a safety shield. The power switch located on the fire control panel had no function in firing mission. This switch is intended for use during maintenance only and should not be located on the fire control panel.

(3) The jettison switches for individual wing stores were located on the pilot's fire control panel and the jettison switch for all wing stores was located on the instrument panel. Stores are normally jettisoned only in an emergency, and the pilot's hands will usually be on the controls during an emergency. These switches, especially the latter, should be located on the cyclic-pitch control stick grip.

(4) The firing switch on the copilot/gunner's cyclic-pitch control stick functioned normally with the XM-18 (inboard wing station) at the beginning of the test. At the end of the test, the switch would not function with either wing station.

g. Night Firing.

(1) All instruments reflected on the glass area around the pilot and copilot/gunner. The pilot could identify the copilot's instruments from their reflections.

(2) During the first night firing run, the copilot/gunner's instrument lights went out. They remained out until the last firing run. During that run, all the rockets aboard were fired in a salvo and the lights came back on.

(3) TAT-102 muzzle flash had no effect on the pilot, but caused the copilot/gunner to have some night blindness. XM-18 muzzle flash was exceptionally high at the pilot's station; visibility outside the cockpit during firing was zero, making nap-of-the-earth flight unsafe. LSFFAR firing posed no problem at night; only momentary flash blinding was encountered.

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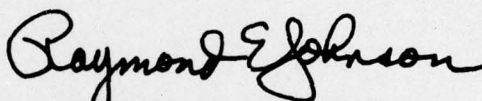
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6. Conclusion. With the exception of the XM-18 Gun Pod, all
armament subsystems tested on the AH-1G are not suitable for Army
use.

7. Recommendation. None.



RAYMOND E. JOHNSON
Colonel, Artillery
President

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